#4

SEQUENCE LISTING

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Yamada, Toshiya

<120> CLONING, EXPRESSION AND USES OF DORSALIN-1

<130> 0575/40314-A

<140> 10/002,278

<141> 2001-11-02

<160> 18

<170> PatentIn version 3.1

<210> 1

<211> 1603

<212> DNA

<213> Chick

a6

<400> 1

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cacatcttgc tcttcaacat ctctattcca cgatatgagg aagtcaccag agctgaactg 540

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aagaacgact cttcatctga agaagaacag agagaagaaa aagccattgc taggccccgt 1020

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a6 cont

<210> 2

<211> 427

<212> PRT

<213> Chick

<400> 2

Met His Tyr Phe Gly Val Leu Ala Ala Leu Ser Val Phe Asn Ile Ile
1 5 10 15

```
Ala Cys Leu Thr Arg Gly Lys Pro Leu Glu Asn Trp Lys Lys Leu Pro
            20                  25                  30

Val Met Glu Glu Ser Asp Ala Phe Phe His Asp Pro Gly Glu Val Glu
        35                  40                  45

His Asp Thr His Phe Asp Phe Lys Ser Phe Leu Glu Asn Met Lys Thr
    50                  55                  60

Asp Leu Leu Arg Ser Leu Asn Leu Ser Arg Val Pro Ser Gln Val Lys
65                  70                  75                  80

Thr Lys Glu Glu Pro Pro Gln Phe Met Ile Asp Leu Tyr Asn Arg Tyr
                85                  90                  95

Thr Ala Asp Lys Ser Ser Ile Pro Ala Ser Asn Ile Val Arg Ser Phe
            100                 105                 110

Ser Thr Glu Asp Val Val Ser Leu Ile Ser Pro Glu Glu His Ser Phe
        115                 120                 125

Gln Lys His Ile Leu Leu Phe Asn Ile Ser Ile Pro Arg Tyr Glu Glu
    130                 135                 140

Val Thr Arg Ala Glu Leu Arg Ile Phe Ile Ser Cys His Lys Glu Val
145                 150                 155                 160

Gly Ser Pro Ser Arg Leu Glu Gly Asn Met Val Ile Tyr Asp Val Leu
                165                 170                 175

Asp Gly Asp His Trp Glu Asn Lys Glu Ser Thr Lys Ser Leu Leu Val
            180                 185                 190

Ser His Ser Ile Gln Asp Cys Gly Trp Glu Met Phe Glu Val Ser Ser
        195                 200                 205

Ala Val Lys Arg Trp Val Lys Ala Asp Lys Met Lys Thr Lys Asn Lys
    210                 215                 220

Leu Glu Val Val Ile Glu Ser Lys Asp Leu Ser Gly Phe Pro Cys Gly
225                 230                 235                 240
```

a6 cont

Lys Leu Asp Ile Thr Val Thr His Asp Thr Lys Asn Leu Pro Leu Leu
245 250 255

Ile Val Phe Ser Asn Asp Arg Ser Asn Gly Thr Lys Glu Thr Lys Val
260 265 270

Glu Leu Arg Glu Met Ile Val His Glu Gln Glu Ser Val Leu Asn Lys
275 280 285

Leu Gly Lys Asn Asp Ser Ser Ser Glu Glu Glu Gln Arg Glu Glu Lys
290 295 300

Ala Ile Ala Arg Pro Arg Gln His Ser Ser Arg Ser Lys Arg Ser Ile
305 310 315 320

Gly Ala Asn His Cys Arg Arg Thr Ser Leu His Val Asn Phe Lys Glu
325 330 335

Ile Gly Trp Asp Ser Trp Ile Ile Ala Pro Lys Asp Tyr Glu Ala Phe
340 345 350

Glu Cys Lys Gly Gly Cys Phe Phe Pro Leu Thr Asp Asn Val Thr Pro
355 360 365

Thr Lys His Ala Ile Val Gln Thr Leu Val His Leu Gln Asn Pro Lys
370 375 380

Lys Ala Ser Lys Ala Cys Cys Val Pro Thr Lys Leu Asp Ala Ile Ser
385 390 395 400

a6 cont

Ile Leu Tyr Lys Asp Asp Ala Gly Val Pro Thr Leu Ile Tyr Asn Tyr
405 410 415

Glu Gly Met Lys Val Ala Glu Cys Gly Cys Arg
420 425

<210> 3

<211> 143

<212> PRT

<213> Artificial Sequence

<220>

<223> COOH-terminus of BMP-2

<220>

<221> DOMAIN

<222> (1)..(143)

<223>

<400> 3

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Glu His Ser Trp Ser Gln Ile Arg Pro Leu Leu Val Thr Phe Gly His
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Asp Gly Lys Gly His Pro Leu His Lys Arg Glu Lys Arg Gln Ala Lys
            20                  25                  30

His Lys Gln Arg Lys Arg Leu Lys Ser Ser Cys Lys Arg His Pro Leu
        35                  40                  45

Tyr Val Asp Phe Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro
    50                  55                  60

Pro Gly Tyr His Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu
65                  70                  75                  80

Ala Asp His Leu Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val
                85                  90                  95

Asn Ser Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu
            100                 105                 110

Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val
        115                 120                 125

Leu Lys Asn Tyr Gln Asp Met Val Val Glu Gly Cys Gly Cys Arg
    130                 135                 140
```

<210> 4

<211> 143

<212> PRT

<213> Artificial Sequence

<220>

<223> COOH-terminus of DPP

<220>

<221> DOMAIN

<222> (1)..(143)

<223>

<400> 4

```
Asp Asp Gly Arg His Lys Ala Arg Ser Ile Arg Asp Val Ser Gly Gly
1               5                  10                  15

Glu Gly Gly Gly Lys Gly Gly Arg Asn Lys Arg His Ala Arg Arg Pro
            20                  25                  30

Thr Arg Arg Lys Asn His Asp Asp Thr Cys Arg Arg His Ser Leu Tyr
        35                  40                  45

Val Asp Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala Pro Leu
    50                  55                  60

Gly Tyr Asp Ala Tyr Tyr Cys His Gly Lys Cys Pro Phe Pro Leu Ala
65                  70                  75                  80

Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu Val Asn
                85                  90                  95

Asn Met Asn Pro Gly Lys Val Pro Lys Ala Cys Cys Val Pro Thr Gln
            100                 105                 110

Leu Asp Ser Val Ala Met Leu Tyr Leu Asn Asp Gln Ser Thr Val Val
        115                 120                 125

Leu Lys Asn Tyr Gln Glu Met Thr Val Val Gly Cys Gly Cys Arg
    130                 135                 140
```

<210> 5

a6 cont

<211> 143

<212> PRT

<213> Artificial Sequence

<220>

<223> COOH-terminus of BMP-6

<220>

<221> DOMAIN

<222> (1)..(143)

<223>

<400> 5

```
Arg Thr Thr Arg Ser Ala Ser Ser Arg Arg Arg Gln Gln Ser Arg Asn
1               5                  10                  15

Arg Ser Thr Gln Ser Gln Asp Val Ala Arg Val Ser Ser Ala Ser Asp
            20                  25                  30

Tyr Asn Ser Ser Glu Leu Lys Thr Ala Cys Arg Lys His Glu Leu Tyr
        35                  40                  45

Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Lys
    50                  55                  60

Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser Phe Pro Leu Asn
65                  70                  75                  80

Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His
                85                  90                  95

Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys Ala Pro Thr Lys
            100                 105                 110

Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn Ser Asn Val Ile
        115                 120                 125

Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
    130                 135                 140
```

a6 cont

<210> 6

<211> 144

<212> PRT

<213> Artificial Sequence

<220>

<223> COOH-terminus of VG-1

<220>

<221> DOMAIN

<222> (1)..(143)

<223>

<400> 6

```
Glu Cys Lys Asp Ile Gln Thr Phe Leu Tyr Thr Ser Leu Leu Thr Val
1               5                  10                  15

Thr Leu Asn Pro Leu Arg Cys Lys Arg Pro Arg Arg Lys Arg Ser Tyr
            20                  25                  30

Ser Lys Leu Pro Phe Thr Ala Ser Asn Ile Cys Lys Lys Arg His Leu
        35                  40                  45

Tyr Val Glu Phe Lys Asp Val Gly Trp Gln Asn Trp Val Ile Ala Pro
    50                  55                  60

Gln Gly Tyr Met Ala Asn Tyr Cys Tyr Gly Glu Cys Pro Tyr Pro Leu
65                  70                  75                  80

Thr Glu Ile Leu Asn Gly Ser Asn His Ala Ile Leu Gln Thr Leu Val
                85                  90                  95

His Ser Ile Glu Pro Glu Asp Ile Pro Leu Pro Cys Cys Val Pro Thr
            100                 105                 110

Lys Met Ser Pro Ile Ser Met Leu Phe Tyr Asp Asn Asn Asp Asn Val
        115                 120                 125

Val Leu Arg His Tyr Glu Asn Met Ala Val Asp Glu Cys Gly Cys Arg
    130                 135                 140
```

a6 Amt

<210> 7

<211> 147

<212> PRT

<213> Artificial Sequence

<220>

<223> COOH-terminus of Activin-A

<220>

<221> DOMAIN

<222> (1)..(147)

<223>

<400> 7

```
Gly Ala Asp Glu Glu Lys Glu Gln Ser His Arg Pro Phe Leu Met Leu
1               5                   10                  15

Gln Ala Arg Gln Ser Glu Asp His Pro His Arg Arg Arg Arg Arg Gly
            20                  25                  30

Leu Glu Cys Asp Gly Lys Val Asn Ile Cys Cys Lys Lys Gln Phe Phe
        35                  40                  45

Val Ser Phe Lys Asp Ile Gly Trp Asn Asp Trp Ile Ile Ala Pro Ser
    50                  55                  60

Gly Tyr His Ala Asn Tyr Cys Glu Gly Glu Cys Pro Ser His Ile Ala
65                  70                  75                  80

Gly Thr Ser Gly Ser Ser Leu Ser Phe His Ser Thr Val Ile Asn His
                85                  90                  95

Tyr Arg Met Arg Gly His Ser Pro Phe Ala Asn Leu Lys Ser Cys Cys
            100                 105                 110

Val Pro Thr Lys Leu Arg Pro Met Ser Met Leu Tyr Tyr Asp Asp Gly
        115                 120                 125
```

a6 cont

Gln Asn Ile Ile Lys Lys Asp Ile Gln Asn Met Ile Val Glu Glu Cys
130 135 140

Gly Cys Ser
145

<210> 8

<211> 139

<212> PRT

<213> Artificial Sequence

<220>

<223> COOH-terminus of TGF-Beta 1

<220>

<221> DOMAIN

<222> (1)..(139)

<223>

<400> 8

Gly Met Asn Arg Pro Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg
1 5 10 15

a6 cont

Ala Gln His Leu Gln Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn
20 25 30

Tyr Cys Phe Ser Ser Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr
35 40 45

Ile Asp Phe Arg Lys Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys
50 55 60

Gly Tyr His Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser
65 70 75 80

Leu Asp Thr Gln Tyr Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn
85 90 95

```
Pro Gly Ala Ser Ala Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro
            100                 105                 110

Leu Pro Ile Val Tyr Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu
        115                 120                 125

Ser Asn Met Ile Val Arg Ser Cys Lys Cys Ser
    130                 135
```

<210> 9

<211> 257

<212> PRT

<213> Mouse

<400> 9

```
Asp Val Leu Glu Asp Ser Glu Thr Trp Asp Gln Ala Thr Gly Thr Lys
1               5                   10                  15

Thr Phe Leu Val Ser Gln Asp Ile Arg Asp Glu Gly Trp Glu Thr Leu
            20                  25                  30

Glu Val Ser Ser Ala Val Lys Arg Trp Val Arg Ala Asp Ser Thr Thr
        35                  40                  45

Asn Lys Asn Lys Leu Glu Val Thr Val Gln Ser His Arg Glu Ser Cys
    50                  55                  60

Asp Thr Leu Asp Ile Ser Val Pro Pro Gly Ser Lys Asn Leu Pro Phe
65                  70                  75                  80

Phe Val Val Phe Ser Asn Asp Arg Ser Asn Gly Thr Lys Glu Thr Arg
                85                  90                  95

Leu Asp Leu Leu Lys Glu Met Ile Gly His Glu Gln Glu Thr Met Leu
            100                 105                 110

Val Lys Thr Ala Lys Asn Ala Tyr Gln Gly Ala Gly Glu Ser Gln Glu
        115                 120                 125

Glu Glu Gly Leu Asp Gly Tyr Thr Ala Val Gly Pro Leu Leu Ala Arg
    130                 135                 140
```

a/k cont.

```
Arg Lys Arg Ser Thr Gly Ala Ser Ser His Cys Gln Lys Thr Ser Leu
145                 150                 155                 160

Arg Val Asn Phe Glu Asp Ile Gly Trp Asp Ser Trp Ile Ile Ala Pro
                165                 170                 175

Lys Glu Tyr Asp Ala Tyr Glu Cys Lys Gly Gly Cys Phe Phe Pro Leu
            180                 185                 190

Ala Asp Asp Val Thr Pro Thr Lys His Ala Ile Val Gln Thr Leu Val
        195                 200                 205

His Leu Lys Phe Pro Thr Lys Val Gly Lys Ala Cys Cys Val Pro Thr
    210                 215                 220

Lys Leu Ser Pro Ile Ser Ile Leu Tyr Lys Asp Asp Met Gly Val Pro
225                 230                 235                 240

Thr Leu Lys Tyr His Tyr Glu Gly Met Ser Val Ala Glu Cys Gly Cys
                245                 250                 255

Arg
```

<210> 10

<211> 40

a6 cont.

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide corresponding to dorsalin-1 amino acid positions 339-345

<220>

<221> primer_bind

<222> (1)..(40)

<223>

<400> 10
tggaattctg gacgaacgtg acttggatac tagtacgtgc 40

<210> 11

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Oligonucleotide corresponding to dorsalin-1 amino acid positions 377-371

<220>

<221> primer_bind

<222> (1)..(42)

<223>

<400> 11
gaggatccaa gacgtgtctt gacgtacagt atacgtgcag tg 42

a6 Cont.

<210> 12

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> ORF-5'

<220>

<221> primer_bind

<222> (1)..(29)

<223>

<400> 12

tggaattcat cgataacgga agctgaagc 29

<210> 13

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> ORF-3'

<220>

<221> primer_bind

<222> (1)..(32)

<223>

<400> 13
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<210> 14

<211> 45

<212> DNA

<213> Artificial Sequence

a6 cont.

<220>

<223> PCR Fragment encoding dorsalin-1 N-terminus

<220>

<221> primer_bind

<222> (1)..(45)

<223>

<400> 14
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<210> 15

<211> 47

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR fragment encoding dorsalin-1 C-terminus

<220>

<221> primer_bind

<222> (1)..(47)

<223>

<400> 15
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<210> 16

<211> 10

<212> PRT

<213> Chick

a6 cont

<400> 16

Ser Ile Gly Ala Glu Gln Lys Leu Ile Ser
1 5 10

<210> 17

<211> 4

<212> PRT

<213> Chick

<400> 17

Arg Ser Lys Arg
1

<210> 18

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> c-myc epitope

<220>

<221> SITE

<222> (1)..(10)

<223>

ab
Ant

<400> 18

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu
1 5 10